A Macro-Monetary Interpretation of Marx's Theory and the End of the "Transformation Problem": Responses to Criticisms by Laibman and Skillman

by Fred Moseley
Mount Holyoke College
fmoseley@mtholyoke.edu

December 2017

This paper is another round in ongoing discussions between myself and David Laibman and Gil Skillman (separately) regarding Marx's theory in *Capital*. Laibman and Skillman have written extensive and thoughtful critiques of my recent book *Money and Totality: A Macro-Monetary Interpretation of Marx's Logic in* Capital *and the End of the 'Transformation Problem'*, which I appreciate very much.

This paper has three sections. The first section is a review of the main points of my macro-monetary interpretation of Marx's theory, and the other two sections respond in turn to the criticisms of Laibman and Skillman. In all quotations, emphasis in *italics* is in the original and emphasis in **bold** is added by me.

1. **Summary of the Macro-Monetary Interpretation**

My interpretation emphasizes the *logical method* employed by Marx in the construction of his economic theory in *Capital* (i.e. the *logical structure* of *Capital*), and reconsiders the "transformation problem" from this perspective of Marx's overall logical method. I argue that there are two main aspects of Marx's logical method that are especially relevant to the transformation problem, and I characterize these two aspects in modern economic terms as *macroeconomic* and *monetary*. Marx's theory is primarily a *macroeconomic* theory (mainly about the *total surplus-value* produced in the economy as a whole) and is also primarily a *monetary* theory (the main variables that are determined in the theory are monetary variables and especially the total surplus-value that is determined in Marx's theory is a *monetary* variable - $\Delta\mathbf{M}$, to use Marx's striking symbolic representation).

1.1. Macro: two levels of abstraction and the prior determination of the total surplus-value

I argue that there are *two main levels of abstraction* in Marx's economic theory: the *production* of surplus-value in Volumes 1 and 2 (i.e. the determination of the total surplus-value produced in the economy as a whole) and the *distribution* of surplus-value in Volume 3 (i.e. the division of the total surplus-value into individual parts; first the equalization of profit rates across industries in Part 2, and then the further division of the total surplus-value into commercial profit, interest, and rent in Parts 4, 5, and 6).

The key point about this logical method is that the production of surplus-value is *theorised prior* to the distribution of surplus-value, i.e. the *total surplus-value* produced in the economy as a whole is determined *logically prior* to the *division* of the total surplus-value into individual parts. First the whole and then the parts. The total surplus-value is determined in the first level of abstraction (the production of surplus-value), and then this total is *presupposed* in the second level of abstraction (the distribution of surplus-value or the subsequent division of the total surplus-value into its individual parts).

This logical progression from the total surplus-value to the individual parts of surplus-value *follows directly from Marx's labour theory of value and surplus-value*. According to Marx's theory, all the individual parts of surplus-value come from the *same source* – the surplus labour of production workers. Therefore, the total surplus-value must be determined first – by surplus labour – and then this total surplus-value is divided into the individual parts, and these individual parts also depend on other factors besides surplus labour (e.g. competition among capitalists which tends to equalise the rate of profit).

The most important and relevant example of this logical progression from the total surplus-value to the individual parts is Marx's theory of *prices of production* in Part 2 of Volume 3. First the total annual surplus-value (S) is determined in Volumes 1 and 2 and then this total annual surplus-value is *presupposed* in the determination of the general rate of profit ($R = S / C$), and the rate of profit is in turn a determinant of prices of production ($P_i = [C_i + V_i] [1 + R]$). (More details are provided in the Appendix to this paper and a longer discussion in Chapter 2 of my book.) As a result of this logical method, the predetermined total surplus-value is distributed to individual industries in such a way that all industries receive the same rate of profit. Thus there is no contradiction between Marx's labour theory of value and equal rates of profit across industries. The rate of profit that is equalized is derived from Marx's labor theory of value and surplus-value.

The "transformation problem" is usually interpreted as a transformation from one set of *micro* variables to another set of *micro* variables – i.e. from *individual labour-values* to *individual prices*. But I argue that this is not what Marx's transformation is about; Marx's transformation is instead from *macro* variables to *micro* variables – i.e. from the *total price* and the *total surplus-value* to *individual prices* and the *individual parts* of surplus-value. The standard interpretation misses entirely the all-important macro aspect of Marx's economic theory and logical method, and the prior determination of the total surplus-value produced in the economy as a whole. The "transformation problem" is essentially a *disaggregation problem,* not a transformation of individual labour-values into individual prices.

I argued in a recent paper (Moseley 2014) that this fundamental logical structure of Marx's theory – capital in general (production of surplus-value) and competition (distribution of surplus-value) – was heavily influenced by Hegel's logic, and in particular the first two moments of Hegel's logic of the Concept – universality and particularity. Marx's *capital in general* corresponds to Hegel's *universality* and Marx's *competition* (or *many capitals*) corresponds to Hegel's *particularity*. The similarity between the two logical structures is that theoretical explanation begins with universality / capital in general and then proceeds to particularity / competition, and the conclusions of the first level of abstraction are presupposed in the second level of abstraction. In Marx's case, the total surplus-value determined at the first level of abstraction of capital in general is presupposed in the theory of the distribution of surplus-value at the second level of abstraction of competition. Marx criticized Hegel for surrounding his method in "mysticism" (i.e. for assuming that the universal is the Absolute Spirit), but Marx praised Hegel for correctly understanding the relation between the universal and the particular forms of the universal. Marx added a quantitative dimension to Hegel's logic in order to explain the total quantity of surplus-value and the division of the total surplus-value into individual parts.

1.2. Single system – actual capitalism

A related aspect of Marx's logical method, which follows from the "two levels of abstraction" and the prior determination of the total surplus-value, is that Marx's theory in all three volumes of *Capital* is about the *same economic system*, i.e. is about a *single system*, and this single system is the *actual capitalist economy*, which is theorised first at the macro level and then subsequently at the micro level.

By contrast, Marx's theory is usually interpreted to be about *two different economic systems* (i.e. the "dual system" interpretation) – first a hypothetical "value system" in Volumes 1 and 2, in which the long-run equilibrium prices of individual commodities are equal to their *values* and then the actual capitalist "price system" in Volume 3, in which the long-run equilibrium prices are equal to their *prices of production*. But I argue that this "dual system" is *not Marx's logical method*. Marx's theory is not about two different economic systems, but is instead about the same economic system – the *actual* capitalist economy – from beginning to end.

In the actual capitalist economy, the long-run equilibrium prices of individual commodities are equal to their *prices of production*, not their values. In Marx's theory, these actual long-run equilibrium prices of individual commodities are partially explained in the Volume 1 macro theory of the total price and total surplus-value, and then they are later more fully explained in the micro Volume 3 theory of the distribution of surplus-value and prices of production. (See Section 1.5 below for more details of this two-stage explanation of the long-run equilibrium prices of individual commodities.)

1.3. Marx's concept of capital and the circuit of money capital

The title of Marx's book is of course *Capital*, thereby clearly indicating the centrality of the concept of *capital* in his theory of capitalism. As Marx put it early in the *Grundrisse*, the first draft of *Capital*:

> The exact development of the concept of capital [is] necessary, since it [is] the fundamental concept of modern economics, just as capital itself, whose abstract, reflected image [is] its concept …, [is] the foundation of bourgeois society. (Marx 1973, p. 331; brackets in the text)

Marx introduced his central concept of capital in Chapter 4 of Volume 1 of *Capital* in the abbreviated form of the "general formula for capital", which is expressed symbolically as:

$$\mathbf{M - C - M'} \qquad \text{where } \mathbf{M' = M + \Delta M}$$

in which M represents the initial money capital advanced to purchase means of production and labour-power, C represents commodities, M' represents the final money capital recovered through the sale of commodities, and ΔM represents the increment of money that emerges at the end of this circuit and is the main purpose and the main result of the circuit. Thus capital is defined by Marx as *money advanced* into circulation in order to *recover more money* from circulation.

Surplus-value is defined as ΔM, or the increment of money that emerges at the end of the circuit of capital. The production of surplus-value is the main purpose of capitalist production, and is the most important phenomenon to be explained by Marx's theory of capitalism (or any theory of capitalism). The general formula for capital focuses Marx's theory on this all-important question: where does the total ΔM come from and what determines its magnitude? In other words, how is the initial M "valorized"? Most of Volume 1 is devoted to this central question for the economy as a whole (see Chapter 3 and Moseley 2004).

Thus we can see that Marx's concept of capital is clearly and emphatically defined in terms of *money*, as '*money that becomes more money*'. The title of Part 2 of Volume 1 is: 'The

Transformation of *Money* into *Capital*'. This definition of capital in terms of money obviously also applies to the two components into which the initial money capital advanced is divided – *constant capital* (advanced to purchase means of production) and *variable capital* (advanced to purchase labour-power). (Marx 1977a, Chapter 8) Algebraically, M = C + V, all in terms of money (C here of course refers to constant capital, not to commodities as in the general formula for capital).

The expanded form of Marx's circuit of money capital is the well-known symbolic expression:

M - C ... P ... C' - (M + ΔM)

This circuit of money capital takes place in *two 'spheres'*, the sphere of *circulation* and the sphere of *production*, and consists of *three phases,* consecutive in time: (1) the *advance* of money capital to purchase means of production and labour-power in the sphere of circulation, prior to production; (2) the *production* process, in the sphere of production; and (3) the *recovery* of money capital through the sale of commodities after production, again in the sphere of circulation. Marx succinctly summarized the circuit of money capital as follows: "*Before* production, we had a capital of *£500*. *After* production is over, we have a capital of *£500* plus a value increment of *£100*." (Marx 1981, p. 124) This increment of £100 is what capitalism is primarily about, and what Marx's theory of capitalism is primarily about.

This circuit of money capital is the general logical framework of Marx's theory of surplus-value. The main goal of Marx's theory is to explain how this all-important phenomenon happens, i.e. how the initial M at the beginning of this circuit becomes (M + ΔM) at the end of the circuit. The "general formula for capital" is *not* just incidentally introduced in Chapter 4 of Volume 1, and then plays no significant role in the rest of the theory; instead the expanded circuit of money capital is the general logical framework of Marx's theory for the rest of the three volumes of *Capital*.

Marx's logical framework of the circuit of money capital is very different from the framework of Sraffian theory, which consists instead of an input-output matrix in terms of physical quantities, the real wage, a labor input vector, unit prices, and a system of simultaneous equations in terms of these variables. Sraffa referred to his logical framework as the "circular flow of production", by which he meant the circular flow of physical inputs and outputs, not the circular flow of quantities of money capital.

In order to compare Sraffa's logical framework with Marx's framework, Sraffa's framework could be represented symbolically as follows:

A,b … P … C'

where A and b stand for the physical quantities of means of production and means of subsistence, respectively. The most striking difference of Sraffa's framework (compared to the Marx's framework) is the *complete absence of money*, especially the absence of ΔM, the most important characteristic of capitalist economies. The first phase of the circulation of money capital in the sphere of circulation – the advance of money capital to purchase means of production and labour-power – is missing altogether in Sraffian theory. It is as if no money capital is advanced in capitalism to purchase means of production and labour-power. But that is not the case. Money capital is advanced in capitalism, in definite quantities, and this quantity of money capital advanced must be recovered before there can be any surplus-value. The fundamental difference between Marx's theory and Sraffa's theory is one of the themes of my book. The two different logical frameworks also means that the currently popular Sraffian interpretation of Marx's theory is a fundamental misinterpretation.

1.4. M presupposed

The next important characteristic of Marx's logical method to be discussed is that the initial money capital **M** at the beginning of the circuit of money capital is *taken as given* or *presupposed,* as initial data, both in the macro theory of the total surplus-value in Volume 1 and in the micro theory of the prices of production individual parts of surplus-value in Volume 3. The initial M exists as a definite magnitude at the beginning of the circuit of capital, prior to the recovery of M' and ΔM, and is in principle a known quantity; thus it is legitimate to take this known quantity at the beginning of the circuit as given in order to explain the M' and ΔM at the end of the circuit. Marx's theory proceeds from the pre-existing known M (money capital advanced) to the unknowns M' (capital recovered) and ΔM (surplus money capital recovered). The pre-existing given M at the beginning of the circuit is the "benchmark" against which M' and ΔM at the end of the circuit are measured and determined.

The logical structure of the circuit of money capital suggests in two ways that the initial money capital (M**)** is *taken as given* or *presupposed* in Marx's theory, both in the macro theory of the production of surplus-value in Volumes 1 and 2 and also in the micro theory of the distribution of surplus-value in Volume 3. In the first place, M is the *starting point* of the circuit of money capital, which suggests that M is also the starting point or the initial data of Marx's theory of the circuit of money capital and ΔM. The circuit of money capital begins with the advance of a definite quantity of money M to purchase means of production and labour-power in the capitalist economy, and Marx's theory of the circuit of money capital begins with this quantity of money capital advanced. As we have seen, the main question which Marx's theory of surplus-value is intended to answer is this: how does a pre-existing quantity of money capital M advanced at the beginning of this circuit become a greater quantity of money (M + ΔM) at the end of the circuit? In Marx's terms, how is the pre-existing M 'valorised'? For this question, the appropriate initial given in the theory is the initial M advanced; this is the quantity of money capital that must be recovered before any ΔM can be appropriated and the initial M "valorised". This initial M becomes a presupposed constituent in the determination of M' and ΔM (see the algebraic Appendix of this paper and Chapter 2 of my book for more details).

The second way in which the structure of the circuit of money capital suggests that the initial M is taken as given is that the *first phase* of the circuit of money capital – the advance of money capital to purchase means of production and labour-power (M - C) – takes place in the *sphere of circulation*, prior to the second phase of production. Marx's theory of the circuit of capital also begins in the sphere of circulation (in Part 2 of Volume 1), with the advance of definite quantities of money constant capital and money variable capital to purchase means of production and labour-power. Thus, when the second phase of the production of value and surplus-value begins, as analyzed in Part 3 and beyond, the quantities of constant capital and variable capital are assumed to have already been advanced in the sphere of circulation to purchase means of production and labor-power, and these already existing quantities of constant capital and variable capital are *taken as given* as the initial data in Marx's theory of how this previously existing given quantity of money capital becomes more money in the subsequent phases of the production and sale of commodities. In this way, the presuppositions of Marx's theory of surplus-value in the sphere of production come from already existing quantities of money capital previously advanced in the sphere of circulation.

Another reason the initial **M** is taken as given in Marx's theory of Δ**M** is that Marx's circuit of money capital refers in principle to the *actual* capitalist economy and to *actual* quantities of money capital advanced and recovered in the real capitalist economy. The Δ**M** that is determined in Volume 1 is the *actual* total ΔM produced in the capitalist economy as a whole, and has to be the actual total ΔM in order to be presupposed in Volume 3. Volume 1 is not about a *hypothetical* economy and a *hypothetical* total ΔM, that would later have to be transformed into the actual total ΔM in Volume 3, as in the traditional interpretation of Marx's theory. Volume 1 is about the *actual* capitalist economy and the *actual* total ΔM from the beginning.

In order to explain the actual total ΔM in Volume 1, the initial quantities of money capital M at the beginning of the circuit must themselves also be the *actual* quantities of money capital advanced to purchase means of production and labour-power in the real capitalist economy; the initial M cannot be *hypothetical* quantities of money capital that are proportional to the labour-values of means of production and means of subsistence (as in the traditional interpretation of Marx's theory).

However, it is not possible to fully explain the actual quantities of money capital in Volume 1, because these actual quantities of money capital are equal to the *prices of production* of the means of production and means of subsistence, and prices of production cannot be explained in Volume 1, because prices of production have to do with the distribution of surplus-value, and (according to Marx's logical method, as discussed above), before the distribution of surplus-value can be explained, the total amount of surplus-value first must be determined, and that is the main task of Volume 1. Therefore, in order to explain the total actual total ΔM in Volume 1, the actual quantities of constant capital and variable capital are *taken as given*, as initial data in the theory of ΔM.

And the crucial point for the "transformation problem" is that, in Marx's theory of prices of production in Volume 3, the *same quantities* of money constant capital and money variable capital are *taken as given* as in the Volume 1 theory of the total surplus-value – the *actual* quantities of money capital advanced to purchase means of production and labor-power at the beginning of the circuit of money capital (in the actual capitalist economy). The only difference between Volume 1 and Volume 3 with respect to C and V is the *level of aggregation* – in Volume 3 the *individual* quantities of constant capital and variable capital advanced in each industry are also taken as given, in addition to the *total* constant capital and variable capital that are taken as given in the macro theory of surplus-value in Volume 1. As discussed above, the question that Marx's theory of prices of production is intended to answer is this: how is the actual money capital advanced in each industry recovered, together with an average share of the total surplus-value according to the capital advanced in each industry? For this question, the appropriate initial givens are the actual initial quantities of money capital advanced and consumed in each industry (the M_i's); the money capital consumed is the quantity that has to be recovered before any profit can be appropriated and the money capital advanced determines the share of the total surplus-value that accrues to each industry.

That is why Marx did *not* "fail to transform the inputs" of constant capital and variable capital from values to prices of production – because no such transformation is necessary or appropriate in Marx's theory. The inputs of constant capital and variable capital in Marx's theory of prices of production in Volume 3 are the *same actual quantities of money capital* advanced in the real capitalist economy that are inputs in Marx's theory of total surplus-value in Volume 1. There are not "two systems" in Marx's theory – a "value system" and a "price system" – with two sets of magnitudes of constant capital and variable capital. Instead, there is only one system in Marx's theory, the actual capitalist economy, with one set of magnitudes of constant capital and variable capital, which is first analyzed at the aggregate level and then at the individual industry level. Therefore, no transformation of constant capital and variable capital is necessary. Constant capital and variable capital are the same actual quantities of money capital at both levels of abstraction. (Please see the algebraic summary in the Appendix to this paper and in Chapter 2 of my book for the details.)

1.5. Two-stage explanation of the presupposed actual M: from the abstract to the concrete

Marx's theory also provides a subsequent explanation of the actual quantities of money capital that are presupposed in the theory of the total surplus-value in Volume 1 and in the theory of individual prices of production in Volume 3. This explanation of the given actual quantities of money capital is presented in two stages, which are necessary because these actual quantities of money constant capital and money variable capital are equal to the prices of production of the means of production and means of subsistence, and these prices of production have to do with the distribution of surplus-value and thus cannot be explained until after the total amount of surplus-value is determined in Volumes 1 and 2.

In Volume 1, it is provisionally assumed that the long-run equilibrium prices of individual commodities are equal to their values, including the prices of the means of production and means of subsistence (which are subsets of the total economy), because that is the only assumption consistent with the labor theory of value at the 'macro' level of abstraction of capital in general in Volume 1. However, this assumption is not exactly true; it is only a *partial explanation*, an *abstract explanation*. Long-run equilibrium prices depend not only on labor-times, but also on the equalization of the profit rate across industries. However, labor-times are the *main determinant* of long-run equilibrium prices, and this partial explanation in Volume 1 enables Marx to explain the main determinant of the prices of labor-power and the means of production, and to analyze the *effects of changes* in the labor-times required to produce these commodities on the given magnitudes of constant capital, variable capital, and surplus-value; for example, the theory of relative surplus-value in Chapter 12 of Volume 1, which analyzes the effect of a reduction in the labor-time required to produce means of subsistence on variable capital and surplus-value.[1]

This partial abstract explanation of the given actual constant capital and variable capital can be expressed algebraically by:

$$\mathbf{C = P^*_{MP} = f\,(L_{MP}, X)} \qquad\qquad \mathbf{V = P^*_{MS} = f\,(L_{MS}, X)}$$

where $\mathbf{P^*_{MP}}$ and $\mathbf{P^*_{MP}}$ are the long-run equilibrium prices of the means of production and means of subsistence, $\mathbf{L_{MP}}$ and $\mathbf{L_{MS}}$ are the labor-times required to produce the means of production and means of subsistence, and **X** is other factors that affect **C** and **V** besides these labor-times and that are *abstracted from* in this partial explanation (i.e. the equalization of the profit rate)

However, the crucial point for our purposes is that this partial explanation of the given actual quantities of constant capital and variable capital (= values) *does not determine the magnitudes* of these variables in Marx's theory of value and surplus-value in Volume 1. It does not determine the magnitude of constant capital that is the transferred value component of the value of commodities produced by commodities; instead the transferred value component of the value of commodities is the *actual money capital* advanced to purchase means of production in the beginning of the circuit of money capital, and this quantity of money capital is taken as given, as a known magnitude, and which in general is not equal to the value of the means of production. Similarly, this partial explanation does not determine the magnitude of variable capital that is subtracted from the new value produced in the current period in order to determine the surplus-value produced; instead the variable capital that is subtracted from new value is the *actual money capital* advanced to purchase

[1] It is *not* assumed that individual commodities actually (tend to) exchange at their values in a hypothetical 'value economy; rather, it is assumed that individual commodities in the actual capitalist economy (tend to) exchange at their prices of production, which depend primarily, but not entirely, on their values, and which are explained more fully in Volume 3.

labor-power, which is taken as given as a known datum, and which in general is not equal to the value of the means of subsistence. In this way, the total surplus-value that is determined in Volume 1 is the actual total surplus-value, not a hypothetical total surplus-value (equal to the value of surplus goods), that later has to be transformed into the actual total profit, which is due to other factors besides surplus labor.

After prices of production have been explained in Chapter 9 of Volume 3, Marx then provided a more *complete explanation* (a more *concrete explanation*) of the given actual quantities of constant capital and variable capital - that these actual quantities are equal to the *prices of production* of the means of production and means of subsistence, and not equal to their values:

$$\mathbf{C = P^*_{MP} = PP_{MP} \qquad V = P^*_{MS} = PP_{MS}}$$

(See Chapter 4, Section 3, of my book for an extensive discussion of this more complete explanation of the given actual quantities of constant capital and variable capital)

But the important point again is that this more complete explanation of the given actual quantities of constant capital and variable capital *does not change the magnitudes* of constant capital and variable capital themselves. The magnitudes of constant capital and variable capital remain the same - the *actual* quantities of money capital advanced to purchase means of production and labour-power in the sphere of circulation, which are taken as given as known data. What changes in Volume 3 is the *explanation* of these given known quantities – from a partial explanation to a more complete explanation, from an abstract explanation to a more concrete one.

1.6. The value of commodities produced by capital

The "value" of commodities in Marx's theory is a complicated concept which has three interrelated aspects– the *substance* of value (abstract labour), the *magnitude* of value (socially-necessary labour-time), and the *necessary form of appearance* of value (money and prices) (see the titles and the contents of the sections of Chapter 1 of Volume 1 of *Capital*). After Section 3 of Chapter 1, the "value" of commodities without further attribution usually refers to the third aspect – the form of appearance of value in terms of money and prices. For example, in the key Chapter 7 of Volume 1, in which Marx presents his basic theory of surplus-value, the value of the cotton and the yarn is always stated in terms of shillings (e.g. 15 shillings, 30 shillings, etc.). In what follows, "value" refers to the price form of value unless otherwise noted.

Furthermore, Marx distinguished between the value of commodities as *products of capital* and the value of *simple commodities* (as analysed by Marx in Part 1 of Volume 1). One key difference has to do with the "transferred value" component of the value of commodities. The transferred value (or "old value") component of the value of simple commodities is proportional to the labor-time required to produce the means of production, but the transferred value component of the value of commodities produced by capital is the *actual constant capital* advanced to purchase the means of production, which tends to be equal to the *price of production* of the means of production, and which is not proportional to the labour-time required to produce the means of production. The means of production are purchased with constant capital at the beginning of the circuit of money capital, and thus the labour-time required to produce the means of production *has already been represented objectively and socially* as this actual quantity of money constant capital advanced (even if somewhat misrepresented; i.e. not proportional); and it is this quantity of actual money capital advanced that becomes the first component of the value-price of commodities produced by capital. This previously existing money constant capital is transferred directly, as a given quantity of money capital, to the value-price of commodities produced by capital.

The other component of the value of commodities produced by capital is the *new value* produced by current labor in the economy as a whole, which is assumed to be equal to the product of the total SNLT in the economy as a whole ($\mathbf{L_c}$) and the money value produced per hour of SNLT (**m**): $\mathbf{N = mL_c}$.

So the value of commodities produced by capital is equal to the sum of these two components: "transferred value" (the actual money capital advanced) plus "new value" produced by current labor:

$$\mathbf{P = C + N = C + mL_c}$$

Please note that this is primarily a *macro* equation that applies to the total commodity product of the economy as a whole. It could also be applied to the price of individual commodities, but then it would be only a partial explanation.

2. Response to Laibman's criticisms

In a draft paper on my book, Laibman (2017) has noted at least partial agreement with my "macro-monetary" interpretation of Marx's theory and has stated that

> the main body of Marx's thought on prices of production is entirely in line with the MMI interpretation... Moseley has done an exemplary job of assembling the relevant texts, showing their path of development through the early "drafts" of *Capital*, laying out his own ("macro-monetary") interpretation, and seeking to find the relations between his own position and any number of present-day positions (including my own). (pp. 20-21).

I appreciate these positive comments.

However, Laibman also contends that my interpretation "cannot serve as a suitable interpretation of Marx and as a proper basis for Marxist scientific research in political economy because it [my interpretation] is *inherently contradictory* and (in that sense) *incoherent*." (p. 22) Laibman argues that the reason for this contradiction and incoherence is that, if the inputs purchased at the beginning of the period of production at prices of production (i.e. are "already transformed"), as I argue, and if these inputs are also outputs of this period (Laibman's case (i)),[2] then:

> the pooling-and-redistribution of surplus value, which is the whole point of the exercise, *cannot happen*. If the capitalists look, after production, and see equal rates of profit everywhere, there is no incentive or need to shift capital from lower to higher rates, and no process of price-of-production formation can take place … since … the input goods … are *already* at prices of production. (pp. 24-25)

And Laibman concludes:

> "*You can't have it both ways*. Prices of production cannot *already exist* for the inputs, and *also* be the result of transformation for the outputs." (p. 25)

[2] Laibman's case (ii) – outputs in the current periods are not inputs (i.e. are luxury goods) or are produced in a separate region – is not my assumption and I will not discuss.

I argue, to the contrary, that Marx's theory does in this sense have it both ways, because inputs were produced in the previous period and outputs are produced in the current period. So there are two periods of production, two equalizations of the profit rate, and two transformation processes. The prices of inputs were transformed in the previous period and the prices of outputs are transformed in the current period.

In Marx's theory, the current period starts with the *advance of money capital* to purchase inputs that were produced in the previous period (M – C). It is assumed that the actual capitalist economy is in long-run equilibrium, so the inputs are purchased at their actual long-run equilibrium prices, i.e. at their prices of production. These prices of production are the result of the equalization of the profit rate in the previous period. The quantities of money capital that purchase these inputs are *taken as given*, as pre-existing quantities, in the determination of the macro total surplus-value and micro the prices of production in the current period. Then production takes place in the current period and a new round of outputs are produced (including outputs that were inputs in the previous period and will be inputs in the next period), and new surplus-value is produced and this new surplus-value has to be distributed according to an equal rate of profit. So another equalization process takes place in the current period and the prices of the output are equal to prices of production. Inputs whose rates of profit had been equalized in the previous period are produced again and their rates of profit are equalized again as outputs. And since the economy is assumed to be in long-run equilibrium, the prices of production of the current period are equal to the prices of production of the previous period.

As discussed above, Sraffian theory ignores the advance of money capital to purchase inputs produced in the previous period and thus ignores the prices of commodities determined in the previous period. It is also assumed that firms somehow own means of production without having purchased them.

According to Laibman's alternative iterative interpretation (following Shaikh; more on this below), firms do advance money to purchase inputs, but it is assumed that (in the first period) the prices of the inputs are equal to *hypothetical values*, not actual prices of production, which means that there is a transformation *problem*, because the hypothetical values must be transformed (over many iterations) into actual prices of production. According to my interpretation, on the other hand, Marx's theory assumes that the prices of the inputs are equal to *actual prices of production* from the beginning and thus *there is no transformation problem*, and Marx did not "fail to transform the inputs".

Laibman also argues that Marx's prior determination of the total surplus-value, which he calls "pool and redistribute" is "only a metaphor". But that is not true; as discussed above, the prior determination of the total surplus-value follows from Marx's labor theory of value and surplus-value and is a key characteristic of Marx's logical method and is the basis for the entire theory of the distribution of surplus-value in Volume 3, not just the equalization of the profit rate across industries, but also the further division of the total surplus-value into commercial profit, interest, and rent in the rest of Volume 3.

Laibman also criticizes my interpretation for taking constant capital and variable capital as given, which he calls a "monstrous begging of the question" (p. 23). But this criticism overlooks the fact that, according to my interpretation, Marx's theory also provides an explanation of the given actual C and V in two stages (as discussed above). Thus my interpretation does not beg the question of the determination of C and V, but instead answers this question in a somewhat complicated way, which is necessary because of the two levels of abstraction in Marx's theory – first a partial explanation of C and V in the macro level of abstraction in Volume 1 and then a more complete explanation of C and V in the micro level of abstraction in Volume 3.

As I mentioned before, Laibman adopts in this paper the iterative interpretation of the transformation presented by Anwar Shaikh (1977). According to this iterative interpretation, Marx's presentation of his theory of prices of production in Part 2 of Volume 3 of *Capital* is *not incorrect*, but is instead only *incomplete*. It is only the first step of a multi-step iterative process, which needs to be completed, and the end results of this iterative process are long run prices of production and the associated rate of profit. Laibman agrees with the Bortkiewicz critique that Marx did not transform the inputs of constant capital and variable capital, but he argues that these inputs can be transformed by an extension of what Marx's first step.

However, this iterative interpretation comes to the same quantitative conclusions as the Bortkiewicz-Sweezy simultaneous interpretation, except for a proportionality factor (because a different invariance postulate is assumed; the rate of profit and relative prices are the same). Indeed, the iterative interpretation is not really a different interpretation of Marx's theory but only an alternative computational method of solving a system of simultaneous equations.

Furthermore, even though labor-values are Laibman's starting point for his iterative derivation of prices of production, the initial magnitudes could be *anything*, i.e. could be *any* arbitrary set of numbers, and the *end results would be the same* prices of production and the *same* rate of profit. The insignificance of the initial magnitudes is one of the characteristics of using this iterative method to solve a system of simultaneous equations. The iterative method is the method used by computers (e.g. Excel) to solve simultaneous equations. The computer "guesses" at the initial values, and then calculates successive approximations of the solutions iteratively until the solution is found. The insignificance of the initial magnitudes does not inspire confidence in this interpretation that labor-values are the real causal factors in the determination of prices of production and the rate of profit.

Laibman also proposes a distinction between Error I ("a crucial logical flaw that strikes at the heart of a theoretical system") and Error II ("an inconsistency, whose removal, through the further development of the theory, leaves the foundation of the theory intact") (p. 26). Laibman argues that Marx's mistake in his theory of prices of production (failing the transform the inputs) is only an Error II mistake. I argue that Marx did not make this mistake in his theory of prices of production at all, but if Marx had made this mistake, then it would be an Error I mistake, because its "removal" contradicts the prior determination of the total surplus-value, which does indeed "strike at the heart" of Marx's theoretical system. This "removal" is not the further development of the theory, but rather its abandonment.

Laibman also argues that the divergence of total profit from total surplus-value is one aspect of the "mystification" of surplus-value, which hides its source in surplus labor. (pp. 31-32) I agree that the "mystification" of surplus-value is indeed a very important part of Marx's theory, and is one of the main themes of Volume 3 of *Capital* – that all the different forms of surplus-value (profit, average profit, commercial profit, interest, and rent) mystify in one way or another that the only source of surplus-value is surplus labor. With average profit and prices of production, each capital receives a share of the total surplus-value in proportion to its size, with no distinction between constant capital and variable capital, thereby mystifying the fact that variable capital is the only real source of surplus-value. This is the mystification that results from average profit and prices of production. Marx emphasized that, in spite of this mystification, *total profit = total surplus-value,* as determined by surplus labor and surplus labor alone. In the divergence of total profit from total surplus-value according to Laibman's interpretation, it does not just *appear* that there is another determinant of the total profit besides surplus labor, there *really is* another determinant – the equalization of profit rates across industries (which has nothing to do with exploitation). This is no longer mystification, but in reality another source of surplus-value.

Laibman also argues that "the Sraffa price system is in fact the *only coherent account of prices, wages, and profits on offer in economic theory*." (p. 14; emphasis added) I agree that Sraffa's theory is logically coherent, but I argue that Marx's theory is also logically coherent, and I argue that there are serious problems in Sraffa's theory that are not present in Sraffa's theory. In the first place, Sraffa's theory has *no theory of money*, a foundational phenomenon of capitalist economies, and as a result no theory of what determines the price level and the trend in the price level over time. Marx's theory, on the other hand, derives in 25 dense pages Chapter 1 (Section 3) of Volume 1 the fundamental function of money as the universal measure of the value of all commodities and presented an integrated theory of value and theory of money. And then devoted another 60 pages in Chapter 3 to a detailed discussion of the main functions of money.

Furthermore, Sraffa's theory is based on very unrealistic assumptions with respect to fixed capital, a very important characteristic of capitalist economies. Fixed capital in Sraffa's theory is assumed to be is entirely consumed in every period, and the output of production in every period is assumed to include hypothetical "partially used machines", whose prices are determined simultaneously in every period along with the prices of actual commodities and the rate of profit (i.e. fixed capital is in effect treated as if it were circulating capital).[3] Laibman acknowledged that my critique of the Sraffian treatment of fixed capital has "some valid reasons". (p. 14, note 10)

[3] Further unrealistic assumptions about fixed capital are also necessary: (1) all the different types of fixed capital goods in an industry (including buildings and equipment) are assumed to have the *same lifetime*, so they can be analyzed together as a "plant", with only one price for all the fixed capital goods in the "plant"; and (2) the "age distribution" of every type of fixed capital good is assumed to be "uniform"; i.e. the quantity of all ages of a given fixed capital good are assumed to be the same, and the total quantity of each type of capital good must be an integer multiple of its lifetime. Surely this is not the way the actual rate of profit and prices of production are determined in the real capitalist economy!

Thus, the rate of profit that is determined in Sraffian theory is not the actual rate of profit, but is instead the rate of profit which includes imaginary profit on "partially used machines", even though these "joint products" are not actually sold on markets and profit is not actually received on these "joint products". This fundamental difference by itself makes it worthwhile to consider Marx's alternative theory of the rate of profit – at least it is about the actual rate of profit.

Marx's theory by contrast has no problem incorporating fixed capital in a realistic way. Fixed capital is taken as given (as a component of the initial money capital **M**), and there is no need to assume hypothetical "partially used machines" as "joint products" with hypothetical prices and a hypothetical rate of profit. Therefore, not only is Marx's theory a coherent theory, it is also preferable to Sraffian theory in these important respects (money and fixed capital.

3. Response to Skillman's criticisms

In his review of my book in the RRPE (forthcoming) Skillman presents three main criticisms of my "macro-monetary" interpretation of Marx's theory and the transformation problem.

3.1 Value and price of commodities produced by capital

Skillmans first criticism has to do with the fundamental determination of the value and the price of commodities in Marx's theory. He argues against my emphasis on Marx's distinction between *simple commodities* and *commodities produced by capital* and especially the different determinations of the *transferred value* component of the value of commodities and my interpreetation that the transferred value component of commodities produced by capital is the *actual constant capital* advanced to purchase means of production at the beginning of the circuit of money capital, which in general is equal to the prices of production of the means of production, not equal to their labor-values. Skillman argues that I "provide no specific reference to Marx's text for this formulation." (p. 5) That is true in Chapter 2 of my book, which is cited by Skillman, because Chapter 2 is an algebraic summary. But it is not true in Chapter 4 which presents substantial textual evidence to support my interpretation. This textual evidence will be reviewed below. Since this is a fundamental issue, it will require some time and space.

Manuscript of 1861-63

The *Manuscript of 1861-63* began with a second draft of Marx's theory of surplus-value (which later turned out to be Parts 2-4 of Volume 1 of *Capital*). This second draft was published for the first time in English in 1988 in the *Marx Engels Collected Works,* Volume 30, and is very interesting and important. This draft is much more clearly developed than the rough and exploratory first draft in the *Grundrisse*. And this draft includes more methodological comments than the "popularized" final versions of Volume 1, including about the inputs to the valorization process – that the inputs to the valorization process are *commodities,* with *already existing prices*:

> Just one more preliminary remark before we proceed to this calculation. All the **prerequisites** of the labour process, all the things that went into it, were **not just use values but commodities**, use values with a **price** expressing their exchange value. **Commodities were present in advance** as **elements** of this process, and must emerge from it again. Nothing of this is shown when we look at the simple labour process as material production.
> We assume that the ***elements*** of the labour process are ***not use values*** to be found in the possession of the money owner himself, but were ***originally acquired as commodities*** by purchase and that this forms the ***prerequisite*** of the entire labour process. (Marx 1988, p. 67-68)

A few pages later, Marx stated that the price of the means of production that is transferred to the value of the output is *presupposed, because* the means of production are themselves *commodities* which are purchased at the beginning of the circulation of capital, and thus the labor-time contained in the means of production *has already been expressed* as the *price* at which the capitalist purchased them. This already existing actual price of the means of production is presupposed and is transferred directly to ("re-appears" in) the value of the output and becomes a "constituent" of the value of the output.

> This value [of the raw material] is however ***already expressed in the price*** at which the material of labour was bought, say e.g. a price of 100 thalers. ***The value of this part of the produce enters into it already determined as price*** ... [The means of labour are] equally purchased. Hence the labour time contained in it, say of 16 working days, ***is expressed in its price of 16 thalers***. (Marx 1988, p. 70)
>
> *The values of the material and means of labour therefore appear again in the product as constituents of its value.* This value is *presupposed*, since the ***labour time contained in the material and means of labour was expressed in their prices in its general form, as social labour***; these are the ***prices at which the money owner bought them as commodities before he began the labour process***. (Marx 1988, pp. 73-74; see also pp. 90 and 92)

I think these passages provide strong textual support for the "monetary" interpretation of the initial givens in Marx's theory of surplus-value presented in this book. The already existing prices of the means of production are a "*presupposed constitutent*" of the value of the product; an "independent, given value, preposited" to the current labour process.[4] The prices of the means of production *re-appear* in the price of the product *because* the means of production *enter the valorization process with already existing prices*.

Marx assumed in this second draft of his theory of surplus-value at the beginning of the *Manuscript of 1861-63* that the prices of the means of subsistence and means of production are equal to their values. Marx had still not yet developed his theory of prices of production and thus still did not consider in this section the possibility that the prices of the means of subsistence and means of production are also equal to their prices of production, not their values. However, Marx would soon thereafter begin to develop his theory of prices of production and also to apply

[4] Marx MECW, v. 30, p. 80.

this theory to the prices of the means of subsistence and means of production in a discussion of Samuel Bailey.

Marx discussed Bailey in a section of the "Theories of Surplus-Value" in this manuscript on Samuel Bailey, and Marx made the important comment that "the only new contribution" made by Bailey was his recognition that one part of the *value* of commodities – the constant capital part that is transferred from the means of production – may be due to *monopoly prices*. Marx quoted Bailey:

> "A commodity, therefore, may owe part of its ***value*** to monopoly, and part to those causes which determine the value of unmonopolised products. An article, for instance, may be manufactured amidst the freest competition out of a raw material, which a complete monopoly enables it producer to sell at six times the actual cost."

Marx then commented: "This remark is correct." The remark that is correct is that "a commodity … may owe a part of its *value* to monopoly", if the means of production are purchased at monopoly prices. The presupposed actual constant capital advanced becomes a component of the *value* of commodities, even though this actual constant capital is a monopoly price and is not equal to the value of the means of production. The value that is transferred to the value of the product is the actual constant capital advanced, not a hypothetical value equal to the value of the means of production.

Marx then goes on to state that he is not concerned with monopoly, but only with the difference between the value and the price of production of the inputs to production. In this case, the magnitude of constant capital that is transferred to the value of commodities is equal to the *price of production* of the means of production, which in general is not equal to the *value* of the means of production.

> It is clear that what applies to the difference between the cost price and the value of the *commodity* as such - as a result of the production process - likewise applies to the *commodity* insofar as, in the form of constant capital, it becomes an ingredient, a pre-

> condition, of the production process. ***Variable capital***, whatever difference between the value and the cost price it may contain, is replaced by a certain quantity of labour which forms a constituent part of the value of the new commodity, ***irrespective of whether its price expresses its value correctly or stands above or below the value***. On the other hand, the difference between the cost price and value, insofar as it enters into the price of the new commodity independently of its own production process, is incorporated into the ***value*** of the new commodity as a ***presupposed*** [vorausgeseztes] element. (Marx 1971, pp. 166-67)

Marx was probably not yet completely clear in his own mind about this important point, but at least he recognized the possibility that constant capital and variable capital are equal to the prices of production of the means of production and means of subsistence, not their values.

"Results"

The "**Results**" manuscript ("The Results of the Immediate Process of Production") was intended to be a summary of Volume 1 of *Capital* (subtitle: "The Production Process of Capital") and a transition to Volume 2. (Marx 1977b)[5] The first section of the manuscript is entitled "**Commodities as Products of Capital**". In this section, Marx explained that *commodities as products of capital* are *different* from the *simple commodities* with which Marx's theory began in Part 1 of Volume 1.

> The *commodity* that emerges from capitalist production is **different** from the commodity we began with as the element, the precondition of capitalist production. We began with the individual commodity viewed as an autonomous article in which a specific amount of labour-time is objectified and which therefore has an exchange-value of a definite amount. (p. 953)

One of the main differences discussed in this section has to do with the *transferred value* component of the value of commodities: that the means of production in capitalist production are *commodities*, which have been purchased by quantities of money capital at the beginning of

[5] This manuscript was written in late 1863 after writing the second draft of Volume 1 in the *Manuscript of 1861*-63, and was published for the first time in English in 1977 in the Penguin edition of Volume 1.

the circulation of money capital, and which therefore *enter the valorization process with already existing specific prices* (as discussed above):

> In other words, then, inasmuch as the commodity is treated as an **autonomous exchange value**, it acts as *money*. Thus since wheat, hay, cattle, seed of all kinds, etc. are *sold* as **commodities** - and since without the sale they cannot be regarded as products - it follows that they *enter production as commodities*, i.e. as **money**... And as a consequence of the valorization process **they are included in the calculations as** *sums of money*, i.e. in the **autonomous form of exchange-value**. (p. 952)

> Since ... the elements of capitalist production already **enter the process of production as commodities**, i.e. **with specific prices**, it follows that **the value added by the constant capital is already given in terms of a price**. For example, in the present case it is **£80** for flax, machinery, etc. (p. 957)

The "Results" manuscript is still at the level of abstraction of capital in general (Volumes 1 and 2), under the general assumption that price = value. Under this general assumption, the actual constant capital advanced and the actual price of the means of production are partially explained as equal to the value of the means of production, i.e. to be determined solely by the labor-time required to produce the means of production. Thus, at the level of abstraction of capital in general, the difference between the transferred value component of simple commodities and the transferred value component of commodities as products of capital is not yet apparent, and Marx treats the two magnitudes interchangeably.

Marx does not mention in the "Results" the complication that in reality the actual constant capital advanced and the actual price of the means of production are equal to *price of production* of the means of production, not their value, and what effect that difference might have (if any) on the transferred value component of the value of commodities as products of capital. Nor does he mention Bailey's "contribution" on this issue. However, the logic of Marx's theory implies that the transferred value component of the value of *commodities as products of capital* is equal to the actual constant capital advanced and consumed ("the value added by the constant capital is already *given* in terms of a price"), which is equal to the price of production of the means of production, not their values, as Marx stated in his discussion of Bailey. The main point to note here is that the constant capital advanced to purchase means of production is *taken as given* and "enters the process of production as commodities, i.e. as specific prices". We will see in the next section that Marx developed this point further in his next draft of *Capital* in the *Manuscript of 1864-65*.

Volume 3 of *Capital* (*Economic Manuscript of 1864-65*)

In **Chapter 1 of Volume 3**, Marx presented a summary of his theory of value and surplus-value presented in Volumes 1 and 2 (this summary has not received the attention it deserves) and introduced the key concept of *cost price*, which is the sum of constant capital and variable capital (**K = C + V**). He referred back to an earlier summary in Chapter 9 of Volume 1 and repeated it with another numerical example:

> We know from Volume 1 (Chapter 9, p. 320) that the value of the product newly formed, in this case £600, is composed of (1) the **reappearing value of the constant capital** of £400 spent on the means of production, and (2) a **newly produced value** of £200. The cost price of the commodity, £500, comprises the reappearing 400c plus a half of the newly produced value of £200, two elements of commodity value that are completely different as far as their origins are concerned. (p. 119)

The "reappearing value of the constant capital" existed prior to the current period, and is taken as given in the determination of the value of the commodities produced in the current period (i.e. it "reappears" as one component of this value), and the "newly produced value" is determined by the labor of the current period. Algebraically:

(1) $\mathbf{P = C + N.}$

Marx continued in the following paragraphs to explain the different roles played by the constant capital and the variable capital in the determination of the value of commodities produced by capital. The constant capital is *transferred directly, as a quantity of money capital, to the value of the product* and thus becomes one component of its value. Thus, constant capital has what Marx called a "*dual significance*" (C.III. 119) - it is both a component of the cost price and it also adds to the value of the product.

> [T]he value of the means of production consumed, a total of £400, is **transferred** from the means of production to the product. This **old value reappears** therefore as a **component of the product's value**, though it does not originate in the production process of *this* commodity. It exists only as a component of the commodity's value **because it existed previously as a component of the capital advanced. The constant capital that was spent is thus replaced by the portion of commodity value that it itself added to this commodity value**. This element of the cost price has therefore a **dual significance**. (pp. 119-20)

On the other hand, variable capital plays an entirely different role in the determination of the value of commodities. Variable capital is *not transferred to the value of the product* and thus does not add to this value. Instead, the variable capital is replaced by living labor in production, and this living labor produces new-value, value which did not previously exist, and which becomes the second component of the value of commodities. Thus, variable capital does *not* have the "dual significance" of constant capital; it is a component of the cost price, but it does not itself add to the value of commodities.

The new value produced by current labor is greater than the variable capital advanced to purchase labor-power and surplus-value is the difference between these two quantities of money capital: **S = N – V.** Thus the new value component of the value of commodities is subdivided into two parts: **N = V + S.**

And by substitution, we arrive at the familiar equation for the value of commodities produced by capital in terms of components of money capital:

(2) **P = C + V + S**

The different roles of constant capital and variable capital in the determination of the value and surplus-value of commodities produced by capital can be illustrated by the following diagram of the circuit of money capital:

$$\begin{array}{lll} \mathbf{M - C} & \mathbf{\ldots\ P\ \ldots} & \mathbf{C' - M'} \\ \quad\mathbf{C} & \quad\mathbf{C} & \quad\mathbf{C} \\ \quad\mathbf{V} & \quad\mathbf{L_c} & \mathbf{N = m\ L_c} \\ & & \mathbf{S = N - V} \\ & & \mathbf{P = C + N} \end{array}$$

Constant capital (**C** in second line above) remains constant throughout the circuit of money capital; that is why it is called “constant” capital (“does not undergo an alternation of value in the process of production”; C.I. 317) Constant capital is taken as given as the actual quantity of money capital advanced to purchase means of production at the beginning of the circuit of money capital, and this given quantity of money capital is *transferred* to the value of the product and recovered through the sale of the product at the end of the circuit.

Variable capital (**V**) does not remain constant capital throughout the circuit of money capital; that is why it is called “variable” capital (“does undergo an alternation of value in the process of production”; C.I. 317) V is also taken as given as the actual quantity of money capital advanced to purchase labor-power at the beginning of the circuit of money capital. However, V is *not transferred* to the value of the product, but is instead *replaced* by living labor, which produces new value greater than variable capital and the difference between these two quantities of money capital is the surplus-value.

However, this is not the way things appear to capitalists and to bourgeois economists. These latter make no distinction between constant capital and variable capital, and instead see surplus-value as somehow arising from both constant capital and variable together and equally. To express this point of view (the capitalist's point of view), Marx defined in this chapter the important new concept of the *cost price* of commodities - the sum of constant capital and variable capital (**K = C + V)**, with no distinction between them.

> After deducting the surplus-value of £100, there remains a commodity **value of £500**, and this simply replaces the **capital expenditure of £500**. This part of the value of the commodity, which replaces the price of the means of production consumed and the labor-power employed, **simply replaces what the commodity cost the capitalist** himself and is therefore the **cost price** of the commodity, as far as he is concerned. (p. 118)

From this point of view, the value of commodities now *appears* to be determined by the sum of the cost price and the surplus-value, and surplus-value appears to arise equally from both components of the cost price. Algebraically, this appearance can be written as:

(3) $\mathbf{P = K + S}$

Marx expressed the transformation of equation (4) into equation (5) as follows:

> If we call the cost price k, the formula $C = c + v + s$ is transformed into the formula $C = k + s$, or commodity **value = cost price + surplus-value**. (p. 118)

In **Chapter 9 of Volume 3**, the cost price of commodities plays a key role in Marx's theory of the prices of production of individual commodities. The price of production in a particular industry is equal to its cost price plus the average profit ($\boldsymbol{\pi_i}$)

(4) $\mathbf{PP_i = K_i + \boldsymbol{\pi_i}}$

The crucial point is that Marx maintained throughout Chapter 9 that *the cost price is the same in the determination of both values and prices of production* (e.g. in Marx's tables in the beginning of Chapter 9). Since the cost price is *the same* in the determination of both values and prices of production, and since cost price = prices of production in the determination of prices of production, it follows that the cost price (including constant capital and variable capital) must also be equal to *prices of production* in the determination of *values* in Volume 1.

One especially clear passage (including with unambiguous algebraic equations) is the following from Marx's draft of Volume 3 (*Marx's Economic Manuscript of 1864-65*) which unfortunately Engels left out in his edited version of Volume 3:

> As we have seen, the *cost price* is always lower than the *value* of the commodity. The *production price* can be lower than, *higher than, or equal to the value* of the commodity. **The value of the commodity is equal to the value of the capital consumed to produce it plus the surplus-value**. If we take the cost price, *cost price* as equal to the **value of the capital advanced** in the production of the commodity (as we did in our original analysis of cost price (*in chapter one*), we arrive at following equivalences:
>
> **Value** = Cost Price + surplus-value $\quad V = K + s$
> or profit as identical with surplus-value $\quad$ or $= K + p$
> ***price of production*** = *cost price + profit* $\quad P = K + p'$
> calculated according to the general rate of profit = p'.
>
> Because K = V - s and V = K + s, the **value** of the commodity is always > than the cost price. Depending on whether s or p' of each special production sphere is bigger or smaller or equal, > < or = to the average profit determined by the general rate of profit, then P > < or = V. Because V = K + s or p, and P = K + p', V = P when s = p', > P when p' < s, and < P when p' > s. (Marx 2016, pp. 275-76; in Engels' edited version of Volume 3 (Marx 1982), this passage should begin on p. 263, line 17)

Notice that in this very interesting "missing" paragraph, there is *only one cost price* mentioned throughout – the value of the capital advanced and consumed – represented algebraically by K, over and over again. There are not two cost prices, one a component of value (K_V?) and the other a component of price of production (K_P?); there is only one K The paragraph begins with "*The* cost price ..." and the *same* cost price is presented as a component of both the value and the price of production of the commodity. The value of the commodity is defined as equal to the cost price plus surplus-value (V = K + s), and the price of production is equal to the *same cost price* plus the average profit (P = K + p'). Since K is the same, whether the price of production is equal to, greater than, or less than, the value depends solely on whether the average profit is equal to, greater than, or less than the surplus-value . All this is clearly and unambiguously stated, and all this assumes that *there is only one cost price* in the determination of both values and prices of production.

One page after this missing paragraph is the long and controversial paragraph on pp. 264-65. In this important paragraph, Marx discusses "an *important modification in the determination of a commodity's cost price*." We saw above that it was originally assumed that the cost price (the given actual money constant capital and variable capital advanced and consumed) is equal to the *value* of the inputs. After having explained the determination of prices of production in Chapter 9, Marx notes in this paragraph that this given actual cost price is instead equal to the *price of production* of the inputs, not their value. However, Marx goes on to say in this paragraph that *the* cost price is still a "*given precondition*", and that the *value* of commodities is still equal to the sum of this *given cost price* plus surplus-value (i.e $P_i = K_i + S_i$), as in equation (3) above), just as before this more complete explanation of the given cost price (e.g. in Part 1 of Volume 3).

The first five sentences of this long and important paragraph is often cited by critics of Marx, who argue that this "modification in the determination of a commodity's cost price" means that the *magnitudes of the cost price are different and must change* in the determination of values and prices of production, and thus that his theory of prices of production presented earlier in Chapter 9 - including the tables illustrating the theory - is *incomplete* and a *mistake,* because it assumes that the cost price in the determination of prices of production is equal to the *values* of the means of production and means of subsistence, but it really should be the prices of production of these inputs. In other words, these key sentences are interpreted to mean that Marx is acknowledging that he "failed to transform the inputs" and that this mistake needs to be corrected. These first five sentences of this paragraph are the following:

> The development given above also involves a ***modification in the determination of a commodity's cost price.*** It was originally assumed that ***the*** cost price of a commodity equaled the value of the commodities consumed in production. But for the buyer of a commodity, it is the price of production that constitutes ***its*** cost price and can thus enter into forming the price of another commodity. As the price of production of a commodity can diverge from its value, so ***the*** cost price of a commodity, in which the price of production of other commodities is involved, can also stand above or below the portion of its total value that is formed by the value of the means of production going into it. It is necessary to bear in mind this ***modified significance of the cost price***, and therefore to bear in mind too that if ***the*** cost price of a commodity is equated with the value of the means of production used up in producing it, it is always ***possible to go wrong***. (pp. 264-65)

The standard interpretation of these sentences is that the "modification in the determination of the cost price" means that there is a change in the magnitude of the cost price, so that there are *two different cost prices*, one equal to the value of the inputs, which is a determinant of the value of the output, and the other equal to the price of production of the inputs, which is a determinant of the price of production of the output. In other words, the *magnitude of the cost price changes* from the determination of value in Volume 1 to the determination of prices of production in Volume 3.

However, this interpretation is not supported by a close examination of these sentences. Marx never states in these sentences that there are two different cost prices, one for the determination of values and the other for the determination of prices of production. To the contrary, Marx refers repeatedly to "the" cost price, suggesting again that there is only one cost price. Marx's point in these sentences is *not* that there are two magnitudes of cost prices, but rather that "the" given cost price is now more completely explained to be equal to the price of production of the inputs, rather than equal to the value of the inputs.

Furthermore, the standard interpretation of these sentences is contradicted by the surrounding paragraphs and the rest of the text of Chapter 9 in which Marx clearly and consistently assumed that the *cost price is the same* in the determination of both the value and the price of production of commodities. If the five sentences just quoted are to be consistent with the rest of Chapter 9, then the standard interpretation of these sentences must be wrong.

Finally, the standard interpretation of these sentences is also contradicted by the rest of the *very same paragraph*, which is generally ignored by Marx's critics. The rest of this paragraph is as follows:

> Our present investigation does not require us to go into further detail on this point. It still remains correct that the cost price of commodities is always smaller than their value. For even if a commodity's cost price may diverge from the value of the means of production, this error in the past is matter of indifference to the capitalist. ***The cost price*** of a commodity is a ***given precondition***, independent of his, the capitalist's, production, while ***the result of his production is a commodity that contains surplus-value***, and therefore an excess value over and above *its* cost price. As a general rule, the principle that ***the*** cost price of a commodity is less than its value has been transformed in practice into the principle that ***its*** cost price is less than the price of production. For the total social capital, where price of production equals value, this assertion is identical with the earlier one that ***the*** cost price is less than the value. Even though it has a different meaning for the particular spheres of production, the ***basic fact remains*** that, taking the social capital as a whole, ***the*** cost price of the commodities that this produces is less than their value, or than the price of production which is identical with this value for the total mass of commodities. (p. 265)

We can see that, after stating in the beginning sentences of this paragraph that the cost price is equal to the price of production of the inputs, rather than the value of the inputs, Marx goes on to say that "the" cost price is still a "given precondition" (in the determination of value and surplus-value), and that surplus-value is still the excess of the value of commodities over *this given cost price*. I think this is a very clear, succinct expression of Marx's overall logical method - *the cost price is a precondition of production, and surplus-value is the result of production*, the excess of the value produced over the given cost price presupposed to production. In other words, the value of commodities is equal to the sum of *this given cost price* plus the surplus-value (i.e. $\mathbf{P_i = K_i + S_i}$), as in the previous paragraphs, even though this given cost price is now understood to be equal to the price of production of the inputs, rather than the value of the inputs. This "modification in the determination of the cost price" *does not mean a change the magnitude* of the single, given cost price, nor does not it mean a change the determination of the value of commodities as the sum of this given cost price and surplus-value. The only thing that changes is the *explanation* of this single, given cost price (the actual cost price), from a partial explanation (equal to the value of the inputs) to a more complete explanation (equal to the price of production of the inputs).

And since the cost price is *the same* in the determination of both values and prices of production, and since cost price = prices of production in the determination of prices of production, it follows that the cost price (including constant capital and variable capital) must also be equal to prices of production in the determination of *values*. Thus in Marx's basic equation for the determination of the value of commodities ($\mathbf{P = C + N}$), constant capital refers to the actual constant capital advanced and consumed in capitalist production, which is taken as given and then later explained in two stages as equal to the prices of production of the means of production.

Volume 1 of *Capital*

A final important piece of textual evidence to support this interpretation of the value of commodities produced by capital is a long footnote at the end of Chapter 5 of Volume 1. In the final paragraph, Marx posed the central question of his theory in clear (and humorous) terms, and issued the following well-known challenge to himself and all others:

> The **transformation of money into capital** [Marx's main question] has to be developed on the basis of the immanent laws of the exchange of equivalents. The

> **money-owner**, who is yet only a capitalist in larval form, must buy commodities at their value, sell them at their value, and yet at the end of the process withdraw more value from circulation than he threw into it in the beginning. His emergence as a butterfly must, and yet must not, take place in the sphere of circulation. *Hic Rhodus, hic salta!* (pp. 268-69)

In the footnote to this passage, Marx clarifies the meaning of these important sentences:

> The reader will see from the foregoing discussion that the meaning of this statement is only as follows: the **formation of capital** must be possible even though the price and the value of a commodity be the same, for it cannot be explained by referring to any divergence between price and value. The continual oscillations in prices, their rise and fall, compensate each other, cancel each other out, and carry out their own reduction to an **average price** which is their internal regulator. This average price is the guiding light of the merchant or the manufacturer in every undertaking of a lengthy nature… If therefore, he [the reader] were at all interested in disinterested thinking, he would formulate the problem of the formation of capital as follows: How can we account for the **origin of capital** on the assumption that **prices are regulated by average prices**, i.e. ultimately by the value of the commodities? I say 'ultimately' because **average prices do not directly coincide with the values of commodities**, as Adam Smith, Ricardo, and others believe. (p. 269)

We can see from this footnote that Marx's theory in Volume 1 is about the "formation of capital" (i.e. the production of surplus-value), and that this theory assumes that commodities exchange at their actual "average prices", which are the "guiding light" of capitalists in making investment decisions. In Volume 1, it is provisionally assumed that these actual average prices are equal to their values (the only assumption that is consistent with the labor theory of value at the macro level of abstraction of capital in general), but in Volume 3 it will be seen that these actual average prices "do not directly coincide" with their values.

Marx does not say so here, but this point applies especially to the prices of the *inputs* of means of production and labor-power. As we have seen, Volume 1 is mainly about the total value and surplus-value produced in the economy as a whole, and individual commodities are not really considered, except as representatives of the total commodity product. The necessary exceptions to this general rule are the inputs of means of production and labor-power, which are purchased at the beginning of the process of the "formation of capital", and whose prices must therefore be taken into consideration. The means of production and means of subsistence are subsets of the total commodity product, and hence their average prices will in general not be equal to their values. This footnote at the end of Chapter 5 clarifies for us implicitly that Marx's theory of surplus-value in Volume 1 is in terms of the actual *average prices* of the means of production and means of subsistence, which are not equal to their values, even though the divergences cannot yet be explained. It is provisionally assumed in Volume 1 that the average prices of the means of production and means of subsistence are equal to their value, but this assumption is not exactly true ("do not directly coincide"). This simplification does not affect the main conclusions of Volume 1.

In my view, in order to be clearer and more rigorous, Marx should have at least included in Chapter 7 a footnote similar to the one in Chapter 5, which would say something like the following: Constant capital and variable capital are the actual quantities of money capital advanced and consumed in the real capitalist economy, and these actual quantities of money capital are taken as given in the theory of value and surplus-value in Volume 1. These actual quantities of constant capital and variable capital are equal to the actual *average prices* of the means of production and means of subsistence, and in Volume 1 it is assumed that these average prices are equal to their respective values, and hence that the actual constant capital and variable capital are equal to the value of the means of production and means of subsistence. However, this partial explanation is not exactly true; the actual average prices of individual commodities, including means of production and means of subsistence, are in general not equal to their values, but are instead equal to their prices of production. However, this lack of equality between average prices and values does not affect the main conclusion of Volume 1 concerning the actual total quantity of surplus-value produced in the economy as a whole. This actual total surplus-value is determined by the difference between the actual new value produced by labor and the actual variable capital advanced to purchase labor-power, even though the actual variable capital is equal to the prices of production of the means of subsistence, not their values. An explanation of prices of production and a more complete explanation of the actual constant capital and the actual variable capital will be given in Volume 3.

We know that in Volume 3 Marx did indeed provide a more complete explanation of the given actual quantities of constant capital and variable capital, as equal to the prices of production of the means of production and means of subsistence. However, this more complete explanation of the actual constant capital and variable capital *does not change their actual given magnitudes*; "**K** is the same" in the determination of both values and prices of production:

value = **K** + s and price of production = **K** + p'.

Therefore, I conclude that there is substantial textual evidence to support my interpretation of the value of commodities produced by capital, which analyzes commodities within the context of the circuit of money capital and in terms of components of money capital: constant capital, variable capital, and surplus-value. And in particular that the "transferred value" component of the value of commodities produced by capital is the actual money constant capital advanced to purchase means of production at the beginning of the circuit of money capital, which is taken as given and then later explained in two stages to be equal to the prices of production of the means of production.

$N = m L_c$

Skillman also criticized me for not providing textual evidence to support what I called "the key assumption in Marx's labor theory of value – that the new value component of the value of commodities is determined by the product of the hours of current SNLT and the *money value produced per hour of abstract labor* (commonly called the monetary expression of value, or the MELT), which I abbreviate as **m**; algebraically: **$N = m L_C$.** Skillman argued that "Marx never made this 'key assumption' in explicating his theory of value". (p. 5)

But Marx did explicitly make this key assumption in the all-important Chapter 7 of Volume 1, in which Marx presented his basic theory of surplus-value, which is presumed and further developed in the rest of the three volumes of *Capital*. In this chapter, the money value produced per hour is assumed to be 0.5 shillings per hour (which is determined by the inverse of the labor-value of an ounce of gold, 2 hours per ounce). Marx's first example is a 6-hour working day in which current labor produces money new value (at the rate of 0.5 shillings per hour) of 3 shillings. And then the second example is a 12-hour working day in which current labor produces money new value (at the same rate) of 6 shillings. Since the variable capital advanced is assumed to be 3 shillings, surplus-value in the first case = 0 and surplus-value in the second case = 3 shillings.

This same example is summarized in Chapter 9 of Volume 1, with a working day of 12 hours and new value = 6 shillings, and thus implicitly m = 0.5 shillings per hour. And this new value is the source of surplus-value and that is why the assumption that $N = mL_C$ is the key assumption in Marx's labor theory of value.

Skillman's textual evidence

Skillman also presents a list of 22 references which he argues "consistently affirm the exclusive determination of commodity values by their conditions of production" (11 references in Volume 1, 2 in Volume 2, and 9 in Volume 3). (p. 3) And he adds:

> This assessment is not challenged by the fact that, beginning in Chapter 7 of *Capital* I, Marx typically refers to value magnitudes in pecuniary terms, as this simply reflects his assumption … that commodity prices are *proportional* to their respective values …" (p. 4)

However, Skillman's list of references does not include any of the important summary passages discussed above in which commodities are analyzed as *products of capital* and the components of the value of commodities produced by capital are components of *capital*: constant capital, variable capital, surplus-value, cost price, and profit. These components of capital are hardly mentioned at all in these references. Instead, most of the passages are about the *substance* of value – labor-time – and not about the form of appearance of value – money or price – and not about the all-important function of money as *capital*. The only passages that mention a component of capital are two passages that explain that a change of the labor-time required to produce the means of production will cause a change of the constant capital, including the constant capital still tied up in production (i.e. that constant capital is valued at the *current cost* of the means of production, not their historical cost. (Volume 1, p. 308 and Volume 3, p. 238) These passages do not contradict my interpretation; rather they provide a partial explanation of constant capital – that constant capital depends primarily, but not solely, on the labor-time required to produce the means of production; and that a change in the labor-time required to produce the means of production is the main cause of changes in the magnitude of constant capital, including a revaluation of the existing constant capital. The same point – a partial explanation – also applies to the few other passages cited by Skillman in Volumes 1 and 2 in which it is stated that price is proportional to labor-value.

One of the well-known passages cited by Skillman as evidence of Marx's assumption of "price-value proportionality" (by "value" Skillman means *labor-time*) is the following from Chapter 9 of Volume 3:

> In Volumes 1 and 2 we were only concerned with the *value* of commodities. Now a part of this value has split away as the *cost price*, on the one hand, while on the other, the *production price* of the commodity has also developed, as a transformed form of value. (p. 263)

This sentence does not say anything about labor-values. This sentence states that *the* cost price "splits away" from the value of commodities and *the same cost price* becomes a component of the price of production. Thus the *same cost price* is a component of both the value and the price of production of commodities produced by capital, as discussed above.

And the very next paragraph in Marx's text is the "missing paragraph" discussed above (the paragraph that Engels left out of his edited Volume 3) in which *the cost price is the same* in the determination of both values and prices of production and the comparisons between them. The quantitative comparisons between value and price of production at the end this paragraph make sense only if the cost price is the same for both values and prices of production.

Controversies over different interpretations of *Capital* are of course notoriously difficult to resolve. I hope that readers will read my Chapter 4 (100 pages) and consider the substantial textual evidence that I provide (some of it published for the first time in recent decades) to support the monetary aspects of my interpretation, including my interpretation of the value of commodities produced by capital ($P = C + mL_c$) within an analytical framework of the circuit of money capital ($M – C \ldots M+\Delta M$). And in particular that in the Volume 1 macro theory of the total surplus-value the transferred value component of the value of commodities produced by capital is the *actual constant capital* advanced and consumed in capitalist production, which is taken as given and then later explained in two stages as equal to the prices of production of the means of production.

One significant advantage of my interpretation is that is makes Marx's theory a *logically consistent whole* and there is no "transformation problem" in Marx's theory; as opposed to the standard interpretation which makes Marx's theory a logically contradictory muddle and there is an insoluble transformation problem and Marx's theory should be rejected for that reason. A widely accepted principle in hermeneutics (the study and interpretation of texts) is that when there are competing interpretations of a text, the preferred interpretation is that one that *makes the text more of a consistent whole*. Based on this principle, it would seem that my "macro monetary" interpretation should be the preferred one. Why continue to insist on the standard interpretation – handed down from Bortkiewicz to Sweezy to Steedman – when there is an alternative interpretation, which is logically sound and with substantial textual evidence, that eliminates the transformation problem and makes Marx's theory a logically consistent whole?

3.2 Two levels of abstraction: the production and distribution of surplus-value and the prior determination of the total surplus-value

Skillman's second criticism of my interpretation (really a set of criticisms) has to do with the first characteristic of my interpretation of Marx's logical method that I discussed above – the two levels of abstraction (the production and distribution of surplus-value) and the prior determination of the total surplus-value. Skillman argues that the two levels of abstraction are mutually inconsistent because commodities are sold at a single price at a single point in time and thus the production and distribution of surplus-value must be determined simultaneously at the same time by this single price. (p. 6)

This criticism seems to interpret the prior determination of the total surplus-value in a *temporal* sense – the production of surplus-value at one point in time and then the distribution of surplus-value at a later point in time. But that is not my interpretation. According my interpretation of Marx's theory, the prior determination of the total surplus-value (by the total surplus labor) means *logically prior* (the whole is determined before the parts), not temporally prior. As discussed in Section 1 above, according to Marx's labor theory of value and surplus-value, the total surplus-value *must be determined logically prior* to its division into individual parts because all the individual parts *come from the same source*, the surplus labor of production workers.

Skillman also argues that my interpretation of the two levels of abstraction is inconsistent with my interpretation that Marx's theory is about a *single system* – the actual capitalist economy. However, Skillman misunderstands the two levels of abstraction in my interpretation of Marx's theory as two regimes of *micro prices of individual sectors* (the value price regime and the price of production regime) and he argues that there cannot be two systems of micro prices in the same economy; that is the "inconsistency". However, according to my interpretation, the first level of abstraction in Volume 1 is a *macro* level abstraction of the total economy, not a hypothetical micro level of abstraction of individual sectors. The "single system" (the actual capitalist economy) is analyzed first at the macro total economy level and then subsequently at the micro sectoral level. So there is no quantitative inconsistency between the two levels of abstraction. The micro prices are derived from the pre-determined macro totals in a logically consistent way. (see Chapter 2 of my book)

Skillman also misunderstands my interpretation of the "two-stage explanation" of the given actual constant capital and variable capital in Marx's theory, which he misinterprets in a *temporal* sense to mean that

> commodities initially exchange in some alternative "partially explained" economy … and then resold in another "fully explained" economy …" (p. 8)

But again that is not my interpretation. According to my interpretation of Marx's theory, commodities always exchange at actual prices of production in the actual capitalist economy; commodities never exchange in an "alternative partially explained" economy. But prices of production and thus the actual quantities of constant capital and variable capital cannot be fully explained in Volume 1, because prices of production depend in part on the equalization of profit rates. However, the prices of means of production and means of subsistence, and hence the actual quantities of constant capital and variable capital, can be partially explained in Volume 1 – that these actual prices depend *primarily,* but *not entirely* on the labor-times required to produce these groups of commodities. And then these same actual prices are later more completely explained in Volume 3 (as prices of production that also depend on the equalization of profit rates). According to my interpretation, there are not two different economies with two different micro exchange regimes, but rather two complementary explanations – partial and complete, from the abstract to the concrete – of the same actual prices of production and the same actual quantities of constant capital and variable capital in the same actual capitalist economy.

3.3 Formal algebraic analysis and the determination of m

Skillman's third set of criticisms of my interpretation of Marx's theory has to do with the algebraic summary of my interpretation in Chapter 2 of my book. One criticism is that I do not prove that the aggregate surplus-value is determined independently of equilibrium prices of production. It is not clear what kind of proof that Skillman thinks is required. As discussed above, the logical priority of the total surplus-value follows from the basic assumption of Marx's labor theory of value and suruplus-value. This basic assumption cannot be proved on purely logical grounds; its validity depends ultimately its *explanatory power* of the important phenomena of capitalist economies, compared to other theories. This is a long discussion that would take us far afield from the transformation problem, which is a logical criticism. I briefly discuss the explanatory power of Marx's theory at the end of my book (pp. 396-98) and more extensively in Moseley 1995, which is a response to an empirical appraisal of Marx's theory by Mark Blaug.

A related criticism is that I do not prove that Marx's two aggregate equalities are satisfied (total profit = total surplus-value and total prices of production = total values). But I derived these two aggregate equalities on pp. 39-40 of my book and a concise summary in the Appendix to this paper. Skillman does not indicate specifically what is wrong with these derivations. I can guess – because these derivations assume that the total surplus-value and the general rate of profit are determined logically prior to prices of production and are presumed in the determination of prices of production. But that is Marx's logical method and it is a sound and viable logical method (the whole before the parts). Within this logical method, these two aggregate equalities are corollaries that are always true. These two aggregate equalities are not true only for the special case of equal compositions of capital across industries, but are also true for the general case of unequal compositions of capital. These two aggregate equalities follow of necessity from Marx's logical method (the prior determination of the total surplus-value and cost price the same in the determination of both values and prices of production.

Skillman's last criticism to be discussed has to do with the key variable in Marx's macro labor theory of value that is commonly called the "MELT" (the monetary expression of labor-time) and which I prefer to call the *money value produced by abstract labor*, and which I abbreviate in my algebra as **m**. The variable **m** is a key variable in Marx's macro theory of the total surplus-value in Volume 1and is a co-determinant (along with the total hours of current

SNLT) of the new value produced in the economy as a whole,; algebraically: $\mathbf{N = mL_C}$. I argue that Marx's theory assumes that **m** is determined by the value of gold, and more precisely that **m** is equal to the inverse of the SNLT required to produce a unit of gold: $\mathbf{m = 1 / L_g}$ (and this determination of **m** is not affected by prices of production in Volume 3; see Chapter 5).

Skillman criticizes me because I do not "show" that **m** is well-defined and unique. This criticism seems to be based on an interpretation at Marx's theory in terms of a system of simultaneous equations and the way to "show" uniqueness is that the number of equations and the number of unknowns must be equal. But my interpretation of Marx's theory is not based on a system of simultaneous equations. Consistent with Marx's general labor theory of value, the SNLT required to produce a unit of gold is the actual quantity of labor-hours, adjusted for skills and unequal intensities of labor. Marx assumed that such a unique quantity exists:

> We assume nothing more than that the production of a given quantity of gold costs, at a given period, **a given amount of labor**. (Volume 1, p. 193)

Finally, Skillman also argues that the assumption in my interpretation that **m** is the same for all industries *requires that the organic composition of capital must be the same in all industries,* including in the industry that produces the money commodity. But that is not true. The determination of **m** has nothing to do with the organic composition of capital, neither in the gold industry nor in all other industries. **m** is determined by the value of gold and is the same in all industries because gold is the *universal equivalent* and the *universal measure* of the money value produced in all other industries.

In Marx's presentation of his basic theory of surplus-value in Chapter 7 of Volume 1 (discussed above), it is assumed that the cotton yarn spinner produces new value at the rate of 0.5 shillings per hour because that is the rate at which the quantity of gold is produced. That rate has nothing to do with the organic composition of capital in the cotton yarn industry and that rate is the same in all industries no matter what their organic compositions might be because that is the rate at which gold, the universal measure of value, is produced. m also does not depend on the organic composition of capital in the gold industry and whether or not the organic composition of capital in the gold industry is equal to the average economy-wide organic composition of capital. m depends on the productivity of labor in the gold industry, not on the organic composition of capital in the gold industry compared to the average organic composition.

Conclusion

The main conclusion of my book and of this paper is that Marx's theory of capitalism is *internally logically consistent.* In the first place, the long-standing and widely-held criticism that Marx "failed to transform the inputs" in his theory of prices of production in Volume 3 is *not a valid criticism*. Marx did not fail to transform the inputs because the inputs are not supposed to be transformed. The inputs of constant capital and variable capital are the *same actual quantities money capital* advanced at the beginning of the circuit of money capital to purchase means of production and labor-power which are taken as given in both the Volume 1 macro theory of the total surplus-value and in the Volume 3 micro theory of prices of production. Micro prices of production can be derived from the macro total surplus-value and general rate of profit in a logically consistent way (please see the algebraic Appendix of this paper).

Thus, there is no contradiction between the labor theory of value and equal rates of profit across industries. Indeed, the labor theory of value explains how the general rate of profit that is equalized across industries is itself determined (by the relation between the total surplus labor and the total capital advanced).

Furthermore, contrary to Laibman, there is no contradiction between the purchase of inputs at prices of production (with equal rates of profit) and the subsequent equalization of the rate of profit of the outputs, because inputs were produced in the previous period and outputs are produced in the current period.

And contrary to Skillman, the two levels of abstraction in Marx's theory – the macro theory of the total surplus-value and the micro theory of the individual parts of surplus-value – are not mutually contradictory because the prior determination of the total surplus-value refers to logical priority, not temporal priority. And these two levels of abstraction in Marx's theory are not inconsistent with the "single system" aspect of my interpretation because the two levels of abstraction do not refer to two economies with two different sets of micro prices of individual commodities, but instead refer to two stages of Marx's theory of the same ("single system") capitalist economy, which is analyzed first at the macro level of abstraction of the total economy and then is analyzed at the micro level of abstraction.

ALGEBRAIC SUMMARY OF THE MACRO-MONETARY INTERPRETATION

Vol. 1 MACRO: Theory of the TOTAL SURPLUS-VALUE and the RATE OF PROFIT

(1)	$S = P - K$	
(2)	$K = \bar{C} + \bar{V}$	**$\bar{C}$ and $\bar{V}$: taken as given**
(3)	$P = \bar{C} + N$	**N: new value (money)**
		$N = m\,L$ (basic assumption of LTV)
(4)	$P = \bar{C} + m\,L$	**m: new value (money) produced per hour**
		L: current labor
(5)	$S = P - K$	
	$= (\bar{C} + N) - (\bar{C} + \bar{V})$	**"dual significance" of $\bar{C}$**
(6)	$S = N - \bar{V}$	
	$= m\,L - m\,(NL)$	**$NL = \bar{V}/m$**
	$= m\,(L - NL)$	
(7)	$S = m\,(SL)$	

(8) $\quad R = S / (\bar{C} + \bar{V})$

Vol. 3 MICRO: THEORY OF INDIVIDUAL PRICES OF PRODUCTION

(9) $\quad PP_i = (\bar{C}_i + \bar{V}_i) + R\,(\bar{C}_i + \bar{V}_i)$

$\bar{C}_i$ and $\bar{V}_i$ taken as given
$\sum \bar{C}_i = \bar{C}$
$\sum \bar{V}_i = \bar{V}$
R pre-determined, as above

"The matter is in itself extraordinarily simple"
TSV.II. 191

TWO AGGREEGATE EQUALITIES

$$\Sigma\,\pi_i = \Sigma\,R\,M_i = R\,\Sigma\,M_i = R\,M = (S/M)\,M = S$$

$$\begin{aligned}\Sigma\,PP_i &= \Sigma\,[\,(C_i + V_i) + R\,M_i\,] \\ &= \Sigma\,C_i + \Sigma\,V_i + R\,\Sigma\,M_i \\ &= C + V + S \\ &= P\end{aligned}$$

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